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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,416	11/06/2003	Daniel C. Edelstein	FIS920030260 US1	8350
29505	7590	02/13/2006	EXAMINER	
DELIO & PETERSON, LLC			ABOAGYE, MICHAEL	
121 WHITNEY AVENUE			ART UNIT	
NEW HAVEN, CT 06510			PAPER NUMBER	

1725

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/702,416

Applicant(s)

EDELSTEIN ET AL.

Examiner

Michael Aboagye

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 6-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/06/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I (claims 1-5) in the reply filed on January 19, 2006 is acknowledged. The traversal is on the ground(s) that there is no additional burden on the examiner to examine all groups of claims together, such that the species are so closely related that the field of search necessary to properly search any one of the species would encompass the other species as well. Therefore, since a different search is not required; there is no serious burden as required by MPEP 803.

This is not found persuasive because, contrary to the applicant's belief, the differences between the disclosed species are such that each species would require a different search. For example, the search for species II – an apparatus with a metallic barrier cap over a metallic interconnect with a diffusion barrier, without a coating will not cover the species III, which includes a metallic wire with a coating. Furthermore, the search for the species I would not uncover the limitations of the species II and III, all of which includes a diffusion barrier.

To further clarify his position, the examiner notes that the election of species is proper because the species disclosed in the instant application are independent inventions as defined in MPEP 806.04 ("If it can be shown that the two or more inventions are in fact independent; applicant should be required to restrict the claims presented to but one of such independent inventions"). Further, regarding election of species, MPEP 808.01(a) sets forth that when "claims are directed to independent

Art Unit: 1725

inventions, restriction is proper pursuant to 35 USC 121, and it is not necessary to show a separate status in the art or separate classification."

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Claim Objections

3. Claim 3 is objected to because of the following informalities:

At the end of line 1, replace " low temperature" with "low melting temperature".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Noddin et al. (US patent No. 5276955).

Noddin et al. discloses an apparatus for low-pressure wire bonding of electronic circuit board and a substrate said apparatus comprising: a copper interconnect within said

Art Unit: 1725

substrate; and an alloy material between a copper interconnect and a gold wire connected to said electronic circuit (see column 3, lines 19 – 49); said alloy material including gold, which is the material for the wire and an alloying metal; wherein said alloy material comprises a low temperature material including Au-Sn or Au-In (see column 5, lines 23 – 43); wherein a concentration of said Sn of said alloy material is used to vary said alloy material's melting point to be greater than that of said alloying metal(see column 10, lines 51 – 64; column 11, lines 1- 31, and column 12, lines 5 – 41).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1725

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang (US Patent No. 6096649) in view of Miller et al. (US Patent No. 4518112).

Jang teaches a structure for low-pressure wire bonding of a semiconductor chip to a substrate "1", said structure comprising: a copper interconnect within said substrate; and an alloy material between said interconnect and a metallic wire "10" connected to said semiconductor chip; wherein said metallic wire is comprised of gold (see, abstract, figure 5 and 6; and column, 1 line 13 - column 4, line 40).

Jang teaches the elements of claim 1 but does not expressly teach that the alloy material includes a composition of the said metallic wire material, and that alloy material comprises a low temperature material including Au-Sn or Au-In; wherein a concentration of said Sn of said alloy material is used to vary said alloy material's melting point to be greater than that of said alloying metal.

However Miller et al. discloses a braze joining of an electronic package elements comprising: a low temperature alloy material including Au-Sn or Au-In; wherein a concentration of said Sn of said alloy material is used to vary said alloy material's melting point to be greater than that of said alloying metal; wherein the bond formed in the electronic package by this alloy material is significantly strong to withstand higher heating without melting and also repeated rework operations (see miller et al. column 1, line 15 – column 2 line 45 and column 3, line 61- column 4, line 40).

Art Unit: 1725

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to have alloy material including Au-Sn or Au-In between the copper interconnect and the gold wire in the semiconductor package of Jang in view of the teachings of Miller et al. with the advantage of forming within the electronic package, a significantly strong bond which can withstand higher heating without melting and also repeated rework operations (see miller et al. column 1, line 15 – column 2 line 45 and column 3, line 61- column 4, line 40).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gerber et al. (US 5401913), Dubin et al. (US 5695810), Lopatin (US 6144096), Chittipeddi et al. (US 6472304) and Zhou et al. (US 6376353) are also cited in PTO-892.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1725

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Michael Aboagye
Assistant Examiner
Art unit 1725

02/08/2006

KEVIN KERNS
PRIMARY EXAMINER
Kevin Kerns 2/8/06